Modicon M580

Change Configuration On The Fly
User Guide

10/2014

EIO0000001590.01

www.schneider-electric.com

Schneider Electric

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

No part of this document may be reproduced in any form or by any means, electronic or mechanical, including photocopying, without express written permission of Schneider Electric.

All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

© 2014 Schneider Electric. All rights reserved.

Table of Contents

	Safety Information	**5**
	About the Book	**9**
Part I	**Introduction to Modicon M580 Change Configuration On The Fly**	**13**
Chapter 1	**Modicon M580 CCOTF Presentation**	**15**
	What is CCOTF?	16
	General Advise for Using CCOTF	17
	Allowed CCOTF Modifications in Modicon M580	19
	Which Parameters Can be Changed with CCOTF?	21
	CCOTF Counting and Status	23
Chapter 2	**CCOTF Prerequisites**	**25**
	Modicon M580 Hardware Compatibility with CCOTF	26
	Modicon M580 Settings for CCOTF	27
Part II	**How to Perform a CCOTF Modification**	**29**
Chapter 3	**Adding a Remote I/O Drop**	**31**
	Adding a Remote I/O Drop Using the Standard Connected Mode	32
	Adding a Remote I/O Drop Using the Virtual Connected Mode	34
Chapter 4	**Adding/Deleting Modules**	**37**
	Adding/Deleting a Module Using the Standard Connected Mode	38
	Adding/Deleting a Module Using the Virtual Connected Mode	41
Chapter 5	**Modifying Module Parameters**	**43**
	Modifying Module Parameters Using the Standard Connected Mode	44
	Modifying Module Parameters Using the Virtual Connected Mode	45
Glossary		**47**

Safety Information

Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

BEFORE YOU BEGIN

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

⚠ WARNING

UNGUARDED EQUIPMENT

- Do not use this software and related automation equipment on equipment which does not have point-of-operation protection.
- Do not reach into machinery during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This automation equipment and related software is used to control a variety of industrial processes. The type or model of automation equipment suitable for each application will vary depending on factors such as the control function required, degree of protection required, production methods, unusual conditions, government regulations, etc. In some applications, more than one processor may be required, as when backup redundancy is needed.

Only you, the user, machine builder or system integrator can be aware of all the conditions and factors present during setup, operation, and maintenance of the machine and, therefore, can determine the automation equipment and the related safeties and interlocks which can be properly used. When selecting automation and control equipment and related software for a particular application, you should refer to the applicable local and national standards and regulations. The National Safety Council's Accident Prevention Manual (nationally recognized in the United States of America) also provides much useful information.

In some applications, such as packaging machinery, additional operator protection such as point-of-operation guarding must be provided. This is necessary if the operator's hands and other parts of the body are free to enter the pinch points or other hazardous areas and serious injury can occur. Software products alone cannot protect an operator from injury. For this reason the software cannot be substituted for or take the place of point-of-operation protection.

Ensure that appropriate safeties and mechanical/electrical interlocks related to point-of-operation protection have been installed and are operational before placing the equipment into service. All interlocks and safeties related to point-of-operation protection must be coordinated with the related automation equipment and software programming.

NOTE: Coordination of safeties and mechanical/electrical interlocks for point-of-operation protection is outside the scope of the Function Block Library, System User Guide, or other implementation referenced in this documentation.

START-UP AND TEST

Before using electrical control and automation equipment for regular operation after installation, the system should be given a start-up test by qualified personnel to verify correct operation of the equipment. It is important that arrangements for such a check be made and that enough time is allowed to perform complete and satisfactory testing.

⚠ CAUTION

EQUIPMENT OPERATION HAZARD

- Verify that all installation and set up procedures have been completed.
- Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.
- Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in injury or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and temporary grounds that are not installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove all temporary grounds from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

About the Book

At a Glance

Document Scope

This guide provides information about the Change Configuration On The Fly (CCOTF) feature in a M580 system, using Unity Pro software.

NOTE: The specific configuration settings contained in this guide are intended to be used for instructional purposes only. The settings required for your specific configuration may differ from the examples presented in this guide.

Validity Note

This document is valid for the M580 system when used with Unity Pro 8.1 or later.

The technical characteristics of the devices described in this document also appear online. To access this information online:

Step	Action
1	Go to the Schneider Electric home page *www.schneider-electric.com*.
2	In the **Search** box type the reference of a product or the name of a product range. ● Do not include blank spaces in the model number/product range. ● To get information on grouping similar modules, use asterisks (*).
3	If you entered a reference, go to the **Product Datasheets** search results and click on the reference that interests you. If you entered the name of a product range, go to the **Product Ranges** search results and click on the product range that interests you.
4	If more than one reference appears in the **Products** search results, click on the reference that interests you.
5	Depending on the size of your screen, you may need to scroll down to see the data sheet.
6	To save or print a data sheet as a .pdf file, click **Download XXX product datasheet**.

The characteristics that are presented in this manual should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the manual and online information, use the online information as your reference.

Related Documents

Title of Documentation	Reference Number
Modicon M580 BME NOC 03•1 Ethernet Module Installation and Configuration Guide	HRB62665 (English), HRB65311 (French), HRB65313 (German), HRB65314 (Italian), HRB65315 (Spanish), HRB65316 (Chinese)
Modicon M580 Remote I/O Modules Installation and Configuration Guide	EIO0000001584 (English), EIO0000001585 (French), EIO0000001586 (German), EIO0000001588 (Italian), EIO0000001587 (Spanish), EIO0000001589 (Chinese)
Modicon M580 Hardware Reference Manual	EIO0000001578 (English), EIO0000001579 (French), EIO0000001580 (German), EIO0000001582 (Italian), EIO0000001581 (Spanish), EIO0000001583 (Chinese)
Modicon M580 System Planning Guide	HRB62666 (English), HRB65318 (French), HRB65319 (German), HRB65320 (Italian), HRB65321 (Spanish), HRB65322 (Chinese)
Modicon M340/X80 BMX NRP 0200/0201 Fiber Converter Module User Guide	EIO0000001108 (English), EIO0000001110 (German), EIO0000001109 (French), EIO0000001111 (Spanish), EIO0000001112 (Italian), EIO0000001113 (Chinese)
Modicon X80 with Unity Pro HART Analog Input/Output Modules User Manual	EAV16400 (English), EAV28404 (French), EAV28384 (German), EAV28360 (Spanish), EAV28413 (Italian), EAV28417 (Chinese)

Title of Documentation	Reference Number
Modicon M340/ X80 with Unity Pro Analog Input/Output Modules User Manual	35011978 (English), 35011980 (French), 35011979 (German), 35011981 (Spanish), 35011982 (Italian), 35011983 (Chinese)
Modicon M340/ X80 with Unity Pro Discrete Input/Output Modules User Manual	35012474 (English), 35012476 (French), 35012475 (German), 35012477 (Spanish), 35012478 (Italian), 35012479 (Chinese)
Modicon M340/ X80 with Unity Pro BMX EHC 0200 Counting Modules User Manual	35013355 (English), 35013357 (French), 35013356 (German), 35013358 (Spanish), 35013359 (Italian), 35013360 (Chinese)
Unity Pro Operating Modes	33003101 (English), 33003102 (French), 33003103 (German), 33003104 (Spanish), 33003696 (Italian), 33003697 (Chinese)
Unity Pro Installation Manual	35014793 (English), 35014792 (French), 35014794 (German), 35014795 (Spanish), 35014796 (Italian), 35012191 (Chinese)
Unity Pro Program Languages and Structure Reference Manual	35006144 (English), 35006145 (French), 35006146 (German), 35006147 (Spanish), 35013361 (Italian), 35013362 (Chinese)

You can download these technical publications and other technical information from our website at www.schneider-electric.com.

Part I
Introduction to Modicon M580 Change Configuration On The Fly

Overview

This part describes the CCOTF feature for Modicon M580 in conjunction with Unity Pro.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
1	Modicon M580 CCOTF Presentation	15
2	CCOTF Prerequisites	25

Chapter 1
Modicon M580 CCOTF Presentation

Overview

This chapter details the CCOTF capabilities and how the CPU executes a CCOTF request.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
What is CCOTF?	16
General Advise for Using CCOTF	17
Allowed CCOTF Modifications in Modicon M580	19
Which Parameters Can be Changed with CCOTF?	21
CCOTF Counting and Status	23

What is CCOTF?

Definitions

Change Configuration On the Fly (CCOTF) is a feature that allows you to modify the PAC hardware configuration and parameters using Unity Pro while the PAC is running normally without impacting the tasks being performed in the other modules.

When a CCOTF modification is executed on a drop, for example Adding / Deleting a module, there is no effect on any other drop in the configuration.

A CCOTF transaction is a set of CCOTF modifications built together in Unity Pro.

In Unity Pro, a CCOTF modification is referred to as a Configuration Online modification in RUN mode and is part of the Online changes; the other changes are performed using **Tools →PLC Screen** and include cold start, warm start, etc. (Refer to Overview of the CPU debugging screen.)

CCOTF can use both standard and virtual connected modes; refer to the descriptions.

Types of CCOTF Modifications

There are several types of CCOTF modifications whether they affect the whole local rack (or the drop), a module or a parameter.

All the CCOTF modifications in one transaction must be of the same type. A drop transaction must affect one drop.

All the module additions / deletions in one transaction must be associated with one task type (MAST, FAST, AUX0 or AUX1).

To know which task types are allowed in a drop, refer to your *Remote I/O Modules Installation and Configuration Guide*.

General Advise for Using CCOTF

Recommendations

⚠ ⚠ DANGER

HAZARD OF ELECTRIC SHOCK

Do not manipulate a module that is supplied by a dangerous voltage.

Failure to follow these instructions will result in death or serious injury.

NOTE: Read and understand the preventive measures that are described in the chapter *Electric Shock: Causes and preventive measures*.

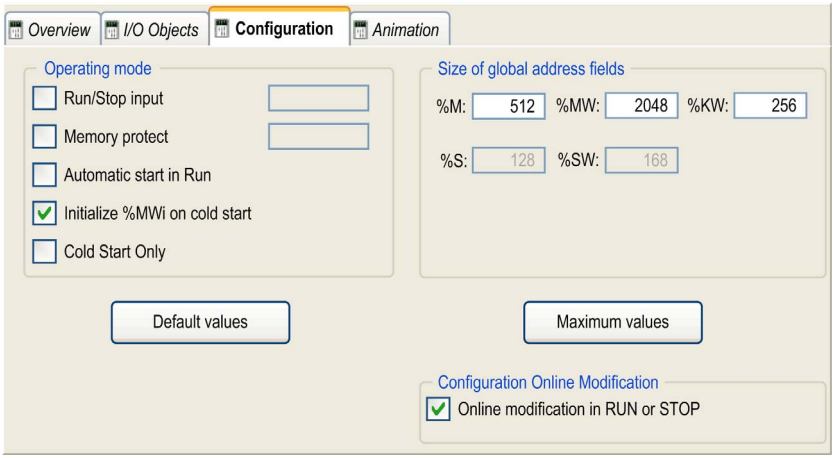
⚠ WARNING

RISK OF UNEXPECTED EQUIPMENT BEHAVIOR

Before any CCOTF modification, ensure that your system responds appropriately. Modifications made when the **Online modification in RUN or STOP** check box is selected in Unity Pro can have an immediate impact on the process.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Modifications made when the **Online modification in RUN or STOP** check box is selected can have an immediate impact on the process.



Take these recommendations into account before adding a remote I/O drop or adding / deleting a module into / from remote I/O drop.

Allowed CCOTF Modifications in Modicon M580

At a Glance

This table shows the limitations for the mechanisms CCOTF and Online change:

What do you want to do?	Local racks			Remote I/O drop
Data Type (Vision)	**IODDT**	**Device DDT**	**Premium IODDT**	**Device DDT**
Add/Delete extended rack	–	–	N	N
Add/Delete digital / analog module	N	N	N	CCOTF: up to 4 digital / analog modules (2)
Add remote I/O drop	–	–	–	CCOTF: 1 drop of modules associated to MAST or not configured
Delete remote I/O drop	–	–	–	N
Modify module configuration parameters	Online change (4)	Online change (1)	Online change	1 module per CCOTF transaction (2) or online change
Modify counter adjust parameters	Online change (3)	N	Online change	1 module per CCOTF (2)
Modify scanner configuration	–	N	N	–
Modify time stamp	N	N		N
Add equipment behind gateway	–	–	–	N
Delete/Modify equipment behind gateway	–	–	–	N
Add/Delete I/O or Timer event section	N	N	N	N
Modify I/O or Timer event section	N	N	N	N

(1) Exceptions:
- Forcing online
- Depriving channels of conf attribute
- Changing the sign of a BMX EHC •••• counter
- Changing the module association with a task

(2) BMX CRA 31210/ BME CRA 31210 is required; you cannot delete digital module with time-stamped channels. No channel task change.
(3) The channel is NOT reset during parameter change. No channel task change.
(4) Except task and event number

Legend: – : irrelevant, N: no available mechanism

For allowed online changes, refer to the description.

NOTE: CCOTF does not allow you to move a module in one modification.

NOTE: CCOTF allows you to copy/paste a module. The new module has the parameter values of the copied module.

NOTE: CCOTF does not allow you to add/delete an extended rack, to unplug a TSX TLY EX line terminator, or the BMX XBC•••K and TSX CBY•••K cables.

Which Parameters Can be Changed with CCOTF?

Analog Input Module Parameters

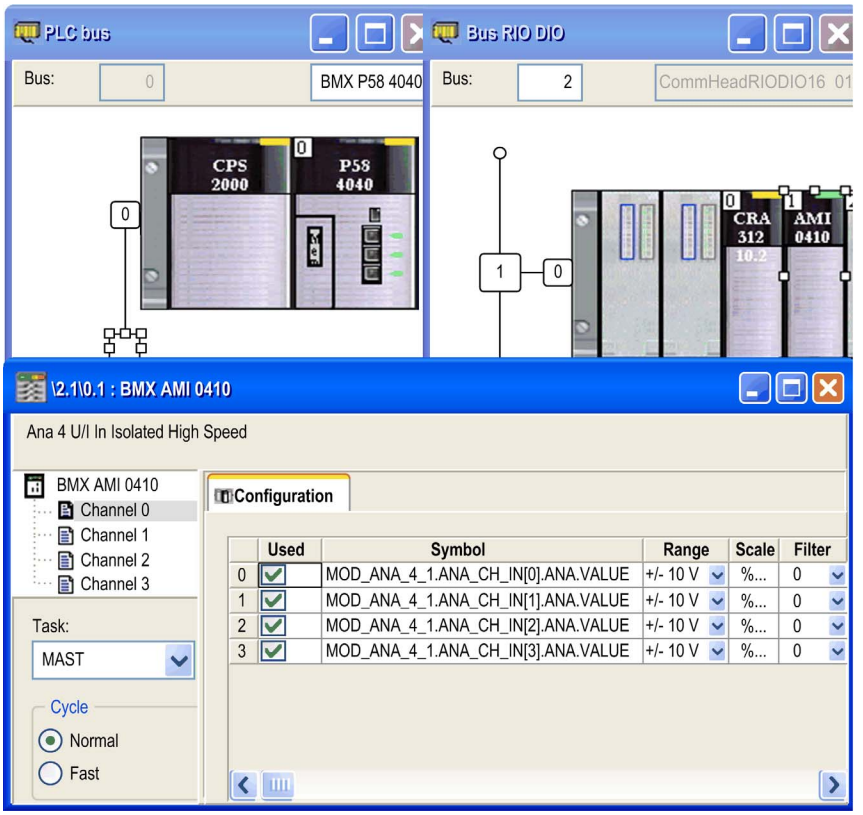
Common:

- Channel Used/not used
- Channel range
- Scale and Overflow

Voltage/Current:

- Filter efficiency (0 ... 6)
- Normal/Fast cycle (channel scan cycle)

A typical configuration parameters screen looks like this:



Temperature:

- Cold junction compensation
- Rejection 50 Hz/60 Hz
- Unit (Celsius/Farenheit)

- Sensor monitor On/Off (Broken wire test)
- Filter efficiency (0 ... 6)

Refer to the description of the %KW and scope of values.

Digital Module Parameters

For all modules except BMX DRA •••• (relay outputs of BMX DDM •••••), each 8-channel group features:

- Supply monitoring

The behavior of each digital output is configurable:

- Fallback/Maintain mode
- Fallback value

Refer to the description.

BMX DDO •••, digital outputs of BMX DDM ••••• (except 16025) feature in addition:

- Reactivate (auto/programmed rearm)

Refer to the description of the %KW.

Analog Output Module Parameters

For all modules:

- Channel Range
- Scale
- Overflow
- Fallback/Maintain mode. Refer to the description
- Fallback value
- Actuator wiring control (Wiring CTRL enabled/disabled)
- Actuator alignment offset value. Refer to the description

Counting Module Parameters

For each counter:

- Function
- Parameters in the Configuration tab
- Parameters in the Adjust tab

CCOTF Counting and Status

CCOTF Modifications Counting Word

The word that counts the CCOTF modifications is used by the embedded rack viewer to retrieve the latest configuration in the CPU and have the CPU, scanner and remote head synchronised.

The system word %SW101 is incremented each time a CCOTF modification is performed in a remote I/O drop.

For more details, refer to the description.

CCOTF Status Word

The CCOTF Status word is %SW66.

Refer to the description.

The Connection status of the added module/distributed equipment is significant only when %SW66 does not indicate that CCOTF is in progress.

The %SW66 values sets the bits 1 and 2 in the CRA_DIAGNOSTIC word.

Status Bits

The CPU scanner Device DDT contains:

- the remote I/O drop health bit
- the health bits of modules in the remote I/O drop

When a module to be added into a drop is being configured, the following bits are set to 0:

- its health bit
- %S117, bit signalling a detected error on the CPU integrated network
- %S10, a global indicator

For details on these bits, refer to *Unity Pro, Program Languages and Structure, Reference Manual*.

When a parameter is modified, the module is restarted and, as in adding, the health bit is set to 0 during several ms. The bits %S10 and %S117 are set to 0.

NOTE: When adding, deleting or modifying parameters in one module, the other modules available in the system are not impacted and their status bits remain at 1.

Chapter 2
CCOTF Prerequisites

Overview

This chapter describes what must be checked or done prior to any CCOTF modification.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Modicon M580 Hardware Compatibility with CCOTF	26
Modicon M580 Settings for CCOTF	27

Modicon M580 Hardware Compatibility with CCOTF

CPU Compatibility

The compatible CPUs are BMX P58 1020, BMX P58 20••, BMX P58 30•• and BMX P58 40••.

The BME XBP •••• backplane allows only Online changes.

CRA Compatibility

It is possible to add a BMX CRA 312•0 or BME CRA 31210.

Analog and Digital Modules Compatibility

The following table lists the M580 I/O modules in remote I/O drops with BM• CRA 312 •0 that can be added / deleted / modified:

Analog Modules	**Digital Modules**		
BMX AMI 0410	BMX DAI 0805	BMX DDI 1602	BMX DDM 16022
BMX AMI 0800	BMX DAI 0814	BMX DDI 1603	BMX DDM 16025
BMX AMI 0810	BMX DAI 1602	BMX DDI 1604	BMX DDM 3202 K
BMX ART 0414(1)	BMX DAI 1603	BMX DDI 3202 K	BMX DRA 0804
BMX ART 0814	BMX DAI 1604	BMX DDI 6402 K	BMX DRA 0805
BMX AMO 0210	BMX DAO 1605	BMX DDO 1602	BMX DRA 1605
BMX AMO 0410		BMX DDO 1612	
BMX AMO 0802		BMX DDO 3202 K	
BMX AMM 0600		BMX DDO 6402 K	
(1) A firmware V2.1 equal or later must be installed			

Counting Modules Compatibility

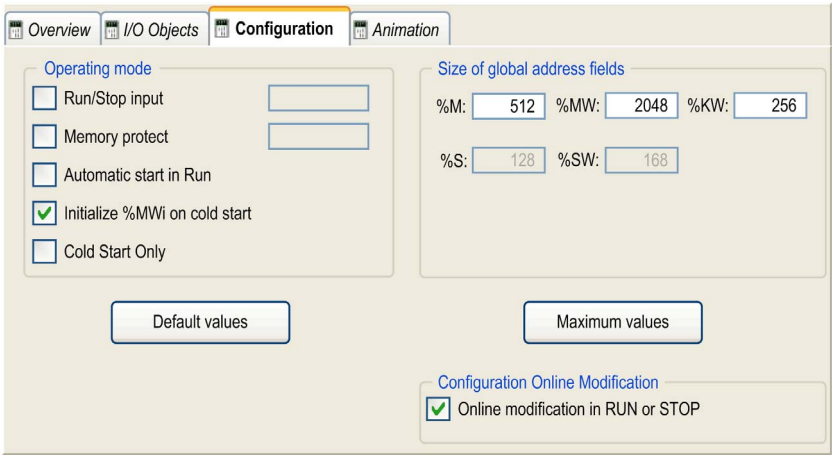
The M580 counting modules whose configuration and adjustment can be modified are:

- BMX EHC 0200
- BMX EHC 0800
- BMX EAE 0300

Modicon M580 Settings for CCOTF

CPU Configuration Screen

To allow CCOTF, in Unity Pro, access the CPU configuration screen and check **Online modification in RUN or STOP**:



Watchdog Values

Set the watchdog timer of each task to the minimum value of 64 ms.

To set the values, refer to Displaying and Modifying Task Properties.

Part II
How to Perform a CCOTF Modification

Overview

This part details the procedures required by the various CCOTF modifications.

What Is in This Part?

This part contains the following chapters:

Chapter	Chapter Name	Page
3	Adding a Remote I/O Drop	31
4	Adding/Deleting Modules	37
5	Modifying Module Parameters	43

Chapter 3
Adding a Remote I/O Drop

Overview

This chapter explains the procedures to add a remote I/O drop.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Adding a Remote I/O Drop Using the Standard Connected Mode	32
Adding a Remote I/O Drop Using the Virtual Connected Mode	34

Adding a Remote I/O Drop Using the Standard Connected Mode

Prerequisite

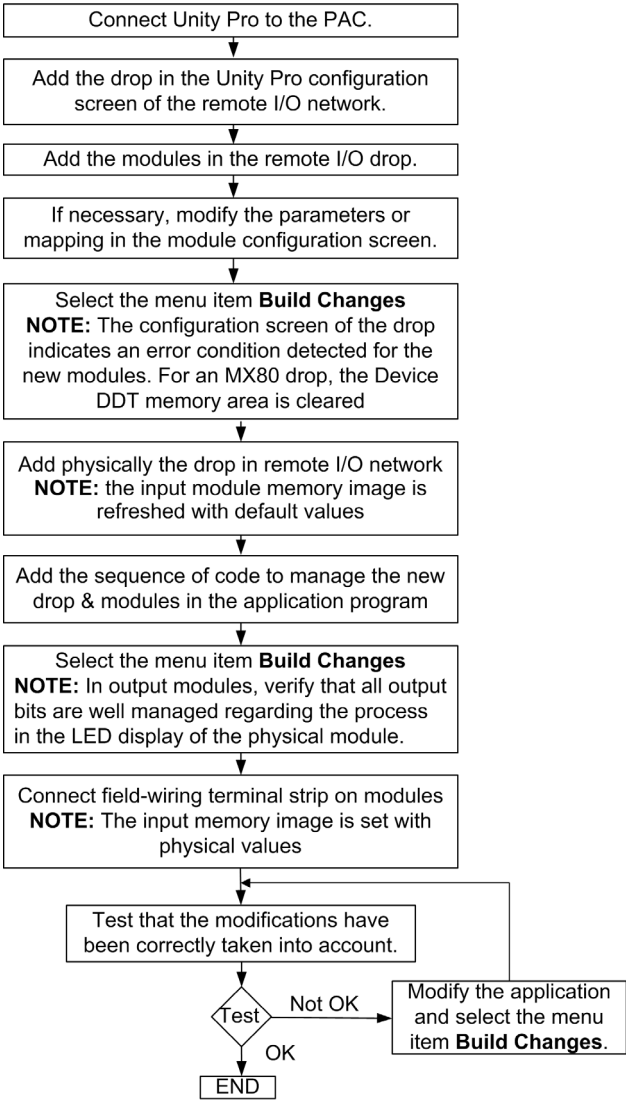
Reminder: The drop must contain only modules associated to the MAST task or not configured.

When you add a remote drop to a running system, you can expect the cycle time and the bandwidth usage to increase.

NOTICE
UNINTENDED EQUIPMENT OPERATION ● Evaluate the margin between watchdog timers and task execution times. Make sure that it is great enough to handle the increased processing time required to support the CCOTF modification. ● Anticipate that there may be some performance decrease due to the increased traffic resulting from the new drop in the system. **Failure to follow these instructions can result in equipment damage.**

Addition

The following flow-chart describes the action to be done when adding a remote I/O drop in the standard connected mode:


Connect Unity Pro to the PAC.
Add the drop in the Unity Pro configuration screen of the remote I/O network.
Add the modules in the remote I/O drop.
If necessary, modify the parameters or mapping in the module configuration screen.
Select the menu item **Build Changes**
NOTE: The configuration screen of the drop indicates an error condition detected for the new modules. For an MX80 drop, the Device DDT memory area is cleared
Add physically the drop in remote I/O network
NOTE: the input module memory image is refreshed with default values
Add the sequence of code to manage the new drop & modules in the application program
Select the menu item **Build Changes**
NOTE: In output modules, verify that all output bits are well managed regarding the process in the LED display of the physical module.
Connect field-wiring terminal strip on modules
NOTE: The input memory image is set with physical values
Test that the modifications have been correctly taken into account.
Test
Not OK
Modify the application and select the menu item **Build Changes**.
OK
END

NOTE: A remote I/O drop contains 1 or 2 racks (linked with a backplane expander cable).

Adding a Remote I/O Drop Using the Virtual Connected Mode

Prerequisite

To switch to virtual connected mode, in the menu **Tools** →**Project settings** →**General** →**Build settings** check the box **Virtual connected mode**.

When you add a remote drop to a running system, you can expect the cycle time and the bandwidth usage to increase.

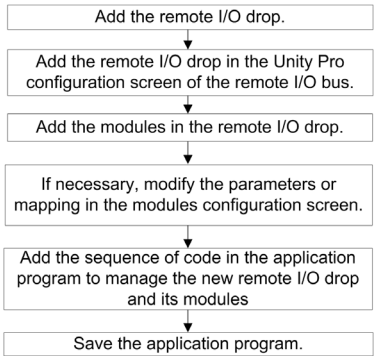
NOTICE
UNINTENDED EQUIPMENT OPERATION ● Evaluate the margin between watchdog timers and task execution times. Make sure that it is great enough to handle the increased processing time required to support the CCOTF modification. ● Anticipate that there may be some performance decrease due to the increased traffic resulting from the new drop in the system. **Failure to follow these instructions can result in equipment damage.**

Two stages are required:

- The Offline stage is for the preparation in Unity Pro,
- The Online stage is for the physical action and downloading into the PAC.

Stage 1: Addition in Offline Mode

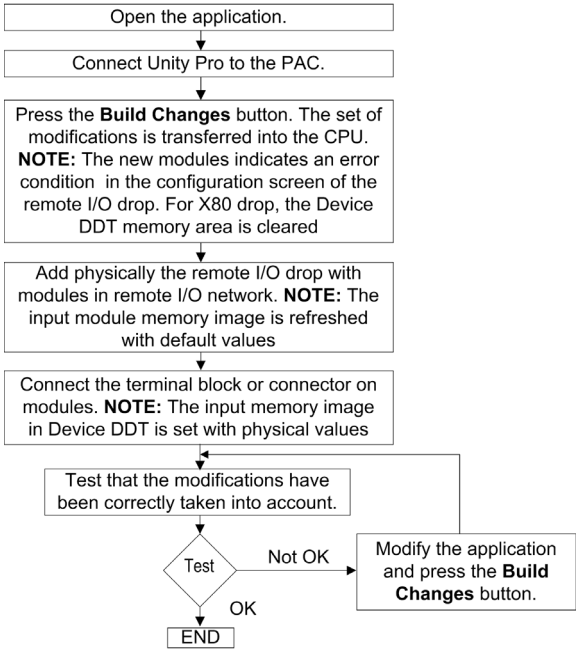
The following flow-chart describes the action to be done Offline:


Add the remote I/O drop.
Add the remote I/O drop in the Unity Pro configuration screen of the remote I/O bus.
Add the modules in the remote I/O drop.
If necessary, modify the parameters or mapping in the modules configuration screen.
Add the sequence of code in the application program to manage the new remote I/O drop and its modules
Save the application program.

NOTE: A remote I/O drop contains 1 or 2 racks (linked with a cable).

Stage 2: Addition when Unity Pro is Connected to the PAC

The following flow-chart describes the action to be done Online:


Open the application.
Connect Unity Pro to the PAC.
Press the **Build Changes** button. The set of modifications is transferred into the CPU. **NOTE:** The new modules indicates an error condition in the configuration screen of the remote I/O drop. For X80 drop, the Device DDT memory area is cleared
Add physically the remote I/O drop with modules in remote I/O network. **NOTE:** The input module memory image is refreshed with default values
Connect the terminal block or connector on modules. **NOTE:** The input memory image in Device DDT is set with physical values
Test that the modifications have been correctly taken into account.
Test
Not OK
Modify the application and press the **Build Changes** button.
OK
END

Chapter 4
Adding/Deleting Modules

Overview

This chapter explains the various procedures to add/delete a module.

What Is in This Chapter?

This chapter contains the following topics:

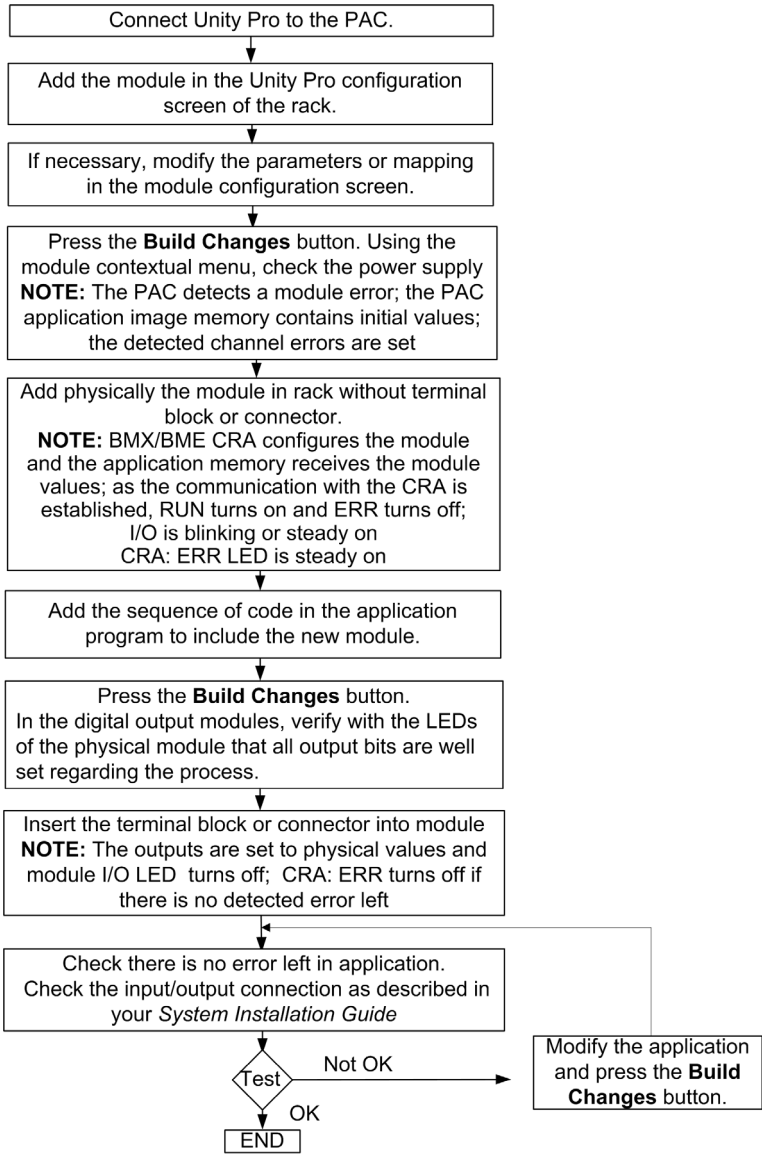
Topic	Page
Adding/Deleting a Module Using the Standard Connected Mode	38
Adding/Deleting a Module Using the Virtual Connected Mode	41

Adding/Deleting a Module Using the Standard Connected Mode

Addition into a Remote I/O Drop

NOTICE
UNINTENDED EQUIPMENT OPERATION ● Evaluate the margin between watchdog timers and task execution times. Make sure that it is great enough to handle the increased processing time required to support the addition of a new module. ● Anticipate that there may be some performance decrease due to the increased traffic if you add a new module to the system. **Failure to follow these instructions can result in equipment damage.**

This describes the action to be done when adding a module in the standard connected mode:


Connect Unity Pro to the PAC.
Add the module in the Unity Pro configuration screen of the rack.
If necessary, modify the parameters or mapping in the module configuration screen.
Press the **Build Changes** button. Using the module contextual menu, check the power supply
NOTE: The PAC detects a module error; the PAC application image memory contains initial values; the detected channel errors are set
Add physically the module in rack without terminal block or connector.
NOTE: BMX/BME CRA configures the module and the application memory receives the module values; as the communication with the CRA is established, RUN turns on and ERR turns off; I/O is blinking or steady on
CRA: ERR LED is steady on
Add the sequence of code in the application program to include the new module.
Press the **Build Changes** button.
In the digital output modules, verify with the LEDs of the physical module that all output bits are well set regarding the process.
Insert the terminal block or connector into module
NOTE: The outputs are set to physical values and module I/O LED turns off; CRA: ERR turns off if there is no detected error left
Check there is no error left in application.
Check the input/output connection as described in your *System Installation Guide*
Test
Not OK
Modify the application and press the **Build Changes** button.
OK
END

Deletion from the Remote I/O Drop

⚠ WARNING

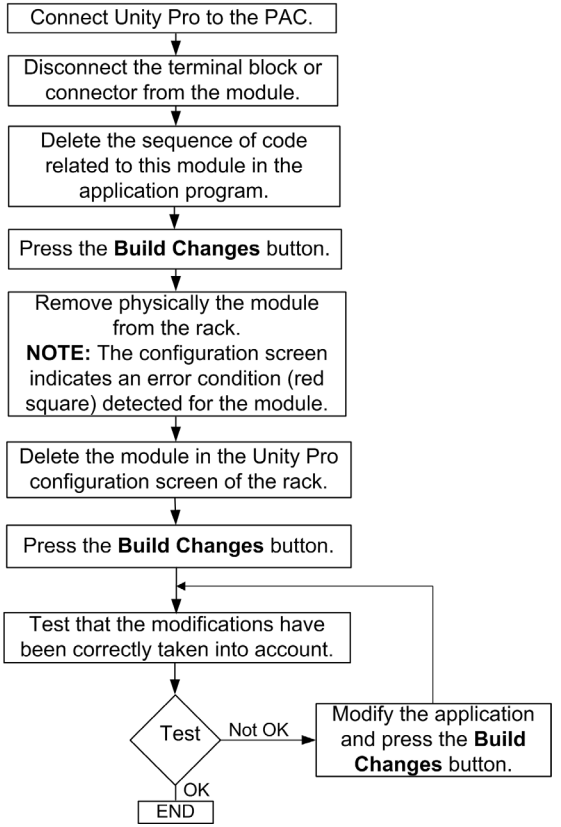
POSSIBLE UNEXPECTED EQUIPMENT BEHAVIOR

Check that the deletion will have no impact on the process nor on the application execution. For input modules, take into account that the input values in the memory image may be forced.

Remove the terminal block or connector from the module before deleting a module.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

This describes the action to be done when deleting a module in the standard connected mode:


Connect Unity Pro to the PAC.
Disconnect the terminal block or connector from the module.
Delete the sequence of code related to this module in the application program.
Press the **Build Changes** button.
Remove physically the module from the rack.
NOTE: The configuration screen indicates an error condition (red square) detected for the module.
Delete the module in the Unity Pro configuration screen of the rack.
Press the **Build Changes** button.
Test that the modifications have been correctly taken into account.
Test
Not OK
Modify the application and press the **Build Changes** button.
OK
END

Adding/Deleting a Module Using the Virtual Connected Mode

Prerequisite

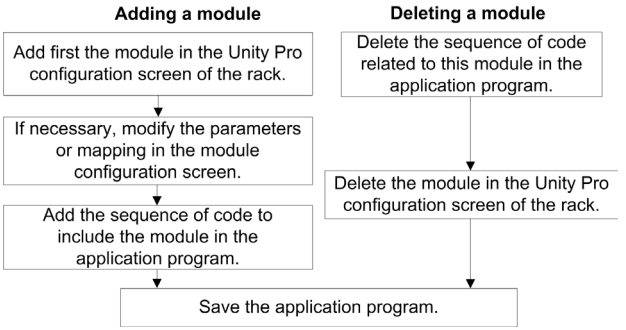
To switch to virtual connected mode, in the menu **Tools →Project settings →General →Build settings** check the box **Virtual connected mode**.

NOTICE
UNINTENDED EQUIPMENT OPERATION ● Evaluate the margin between watchdog timers and task execution times. Make sure that it is great enough to handle the increased processing time required to support the addition of a new module. ● Anticipate that there may be some performance decrease due to the increased traffic if you add a new module to the system. **Failure to follow these instructions can result in equipment damage.**

Two stages are required:
- The Offline stage is for the preparation in Unity Pro,
- The Online stage is for the physical action and downloading into the PAC.

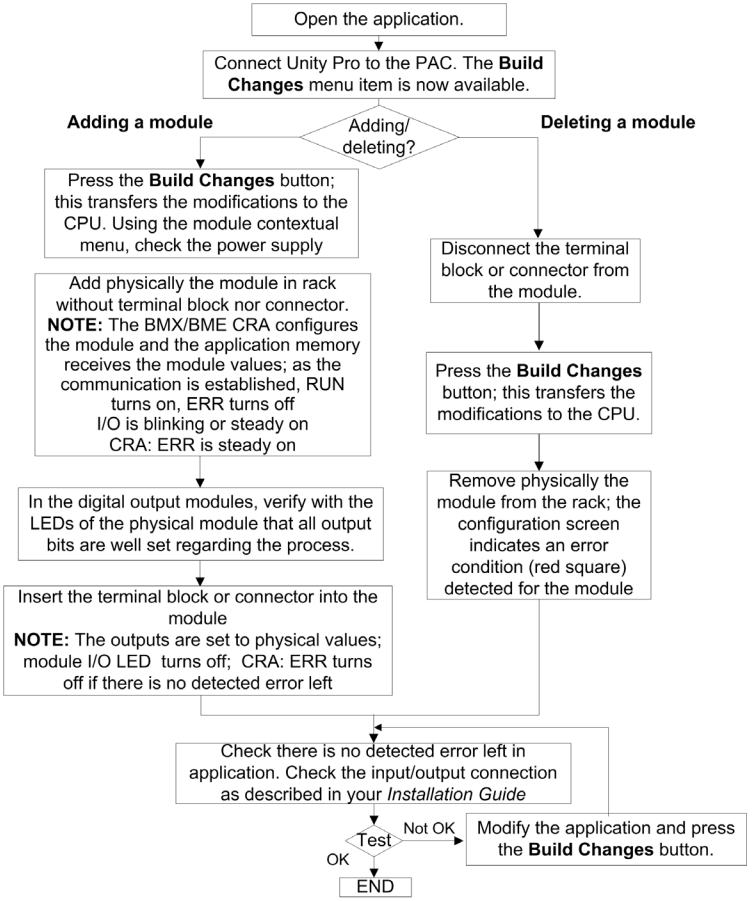
Stage 1: Addition/Deletion in Offline Mode

The following flow-chart describes the action to be done Offline:


Adding a module
Deleting a module
Add first the module in the Unity Pro configuration screen of the rack.
Delete the sequence of code related to this module in the application program.
If necessary, modify the parameters or mapping in the module configuration screen.
Delete the module in the Unity Pro configuration screen of the rack.
Add the sequence of code to include the module in the application program.
Save the application program.

Stage 2: Addition/Deletion into/from a Drop when Unity Pro is Connected to the PAC

The following flow-chart describes the action to be done Online:


Open the application.
Connect Unity Pro to the PAC. The **Build Changes** menu item is now available.
Adding/ deleting?
Adding a module
Deleting a module
Press the **Build Changes** button; this transfers the modifications to the CPU. Using the module contextual menu, check the power supply
Add physically the module in rack without terminal block nor connector. **NOTE:** The BMX/BME CRA configures the module and the application memory receives the module values; as the communication is established, RUN turns on, ERR turns off I/O is blinking or steady on CRA: ERR is steady on
In the digital output modules, verify with the LEDs of the physical module that all output bits are well set regarding the process.
Insert the terminal block or connector into the module **NOTE:** The outputs are set to physical values; module I/O LED turns off; CRA: ERR turns off if there is no detected error left
Disconnect the terminal block or connector from the module.
Press the **Build Changes** button; this transfers the modifications to the CPU.
Remove physically the module from the rack; the configuration screen indicates an error condition (red square) detected for the module
Check there is no detected error left in application. Check the input/output connection as described in your *Installation Guide*
Test
Not OK
Modify the application and press the **Build Changes** button.
OK
END

Chapter 5
Modifying Module Parameters

Overview

This chapter explains the various procedures to modify the module parameters values.

What Is in This Chapter?

This chapter contains the following topics:

Topic	Page
Modifying Module Parameters Using the Standard Connected Mode	44
Modifying Module Parameters Using the Virtual Connected Mode	45

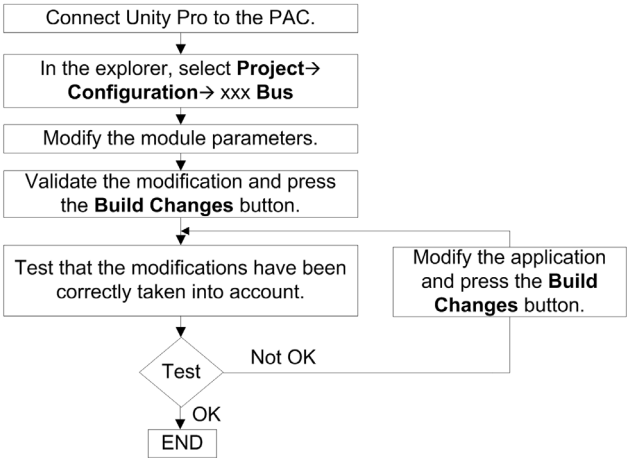
Modifying Module Parameters Using the Standard Connected Mode

Parameter Modifications

Modifications made when the **Online modification in RUN or STOP** checkbox is selected can have an immediate impact on the process.

⚠ WARNING
UNINTENDED EQUIPMENT OPERATION Before doing any CCOTF modification, understand the consequences of changing the parameters. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

The following flow-chart describes the action to be done to modify module parameters *(see page 21)* using the standard connected mode:


Connect Unity Pro to the PAC.
In the explorer, select **Project**→ **Configuration**→ xxx **Bus**
Modify the module parameters.
Validate the modification and press the **Build Changes** button.
Test that the modifications have been correctly taken into account.
Modify the application and press the **Build Changes** button.
Test
Not OK
OK
END

Modifying Module Parameters Using the Virtual Connected Mode

Prerequisite

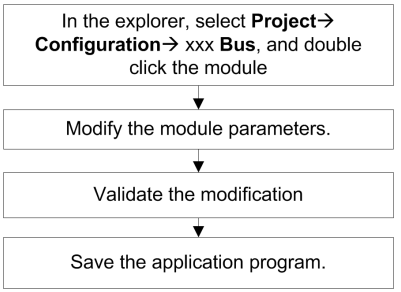
To switch to virtual connected mode, in the menu **Tools** →**Project settings** →**General** →**Build settings** check the box **Virtual connected mode**.

Modifications made when the **Online modification in RUN or STOP** checkbox is selected can have an immediate impact on the process.

⚠ WARNING
UNINTENDED EQUIPMENT OPERATION Before doing any CCOTF modification, understand the consequences of changing the parameters. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

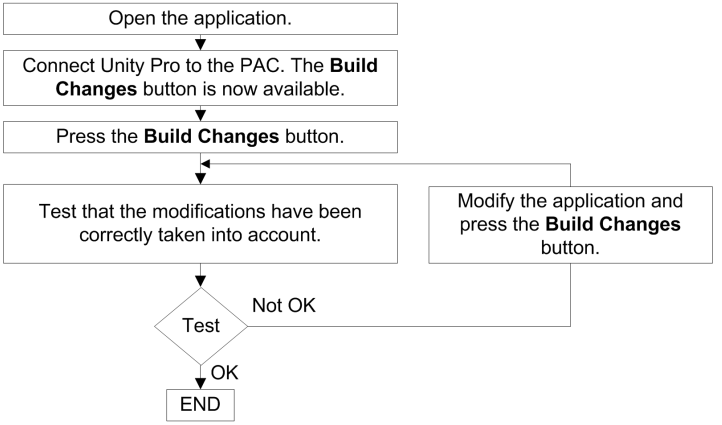
Stage 1: Parameter Modifications in Offline Mode

The following flow-chart describes the action to be done Offline to modify module parameters *(see page 21)*:


In the explorer, select **Project**→ **Configuration**→ xxx **Bus**, and double click the module
Modify the module parameters.
Validate the modification
Save the application program.

Stage 2: Parameter Modifications when Connected to the PAC

The following flow-chart describes the actions to complete the modification:


Open the application.
Connect Unity Pro to the PAC. The **Build Changes** button is now available.
Press the **Build Changes** button.
Test that the modifications have been correctly taken into account.
Modify the application and press the **Build Changes** button.
Test
Not OK
OK
END

Glossary

D

Device DDT (DDDT)

A Device DDT is a DDT predefined by the manufacturer and not modifiable by user. It contains the I/O language elements of an I/O module.

DRS

(*dual-ring switch*) A ConneXium extended managed switch that has been configured to operate on an Ethernet network. Predefined configuration files are provided by Schneider Electric to downloaded to a DRS to support the special features of the main ring / sub-ring architecture.

I

IODDT

(*input/output derived data type*) A structured data type representing a module, or a channel of a CPU. Each application expert module possesses its own IODDTs.

L

local rack

An M580 rack containing the CPU and a power supply. A local rack consists of one or two racks: the main rack and the extended rack, which belongs to the same family as the main rack. The extended rack is optional.

R

RIO drop

One of the three types of RIO modules in an Ethernet RIO network. A RIO drop is an M580 rack of I/O modules that are connected to an Ethernet RIO network and managed by an Ethernet RIO adapter module. A drop can be a single rack or a main rack with an extended rack.